Evaluation of Diagnostic Values of Culture, Rapid Urease Test, and Histopathology in the Diagnosis of Helicobacter pylori Infection and in vitro Effects of Various Antimicrobials against Helicobacter pylori

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Abstract : Aim: The aim of this study, was to investigate the presence of Helicobacter pylori (H. pylori) infection by culture, histology, and RUT (Rapid Urease Test) in gastric antrum biopsy samples taken from patients presented with dyspeptic complaints and to determine resistance rates of amoxicillin, clarithromycin, levofloxacin and metronidazole against the H. pylori strains by E-test. Material and Methods: A total of 278 patients who admitted to Konya Education and Research Hospital Department of Gastroenterology with dyspeptic complaints, between January 2011-July 2013, were included in the study. Microbiological and histopathological examinations of biopsy specimens taken from antrum and corpus regions were performed. The presence of H. pylori in biopsy samples was investigated by culture (Portagerm pylori-PORT PYL, Pylori agar-PYL, GENbox microaer, bioMerieux, France), histology (Giemsa, Hematoxylin and Eosin staining), and RUT(CLOtest, Cimberly-Clark, USA). Antimicrobial resistance of isolates against amoxicillin, clarithromycin, levofloxacin, and metronidazole was determined by E-test method (bioMerieux, France). As a gold standard in the diagnosis of H. pylori; it was accepted that the culture method alone was positive or both histology and RUT were positive together. Sensitivity and specificity for histology and RUT were calculated by taking the culture as a gold standard. Sensitivity and specificity for culture were also calculated by taking the co-positivity of both histology and RUT as a gold standard. Results: H. pylori was detected in 140 of 278 of patients with culture and 174 of 278 of patients with histology in the study. H. pylori positivity was also found in 191 patients with RUT. According to the gold standard criteria, a false negative result was found in 39 cases by culture method, 17 cases by histology, and 8 cases by RUT. Sensitivity and specificity of the culture, histology, and RUT methods of the patients were 76.5 % and 88.3 %, 87.8 % and 63 %, 94.2 % and 57.2 %, respectively. Antibiotic resistance was investigated by E-test in 140 H. pylori strains isolated from culture. The resistance rates of H. pylori strains to the amoxicillin, clarithromycin, levofloxacin, and metronidazole was detected as 9 (6.4 %), 22 (15.7 %), 17 (12.1 %), 57 (40.7 %), respectively. Conclusion: In our study, RUT was found to be the most sensitive, culture was the most specific test between culture, histology, and RUT methods. Although we detected the specificity of the culture method as high, its sensitivity was found to be quite low compared to other methods. The low sensitivity of H. pylori culture may be caused by the factors affect the chances of direct isolation such as spoild bacterium, difficult-to-breed microorganism, clinical sample retrieval, and transport conditions.
Keywords : antimicrobial resistance, culture, histology, H. pylori, RUT
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